In the Claims

Please cancel claims 9 and 11 – 20. Please amend claims 1 and 8.

1. (Currently Amended) A method of fabricating gradient-index microlenses in optical polymeric fluids using an ink-jet printhead, comprising:

depositing a first series of droplets of a first optical polymeric fluid having an index of refraction, from an ink-jet printhead, onto a substrate;

coalescing said first series of droplets to form the base portion of a partially formed microlens;

depositing a second series of droplets of a second optical polymeric fluid compatible with said first optical polymeric fluid from an ink-jet printhead onto the partially formed microlens, the second optical polymeric fluid having an index of refraction higher than that of said first optical polymeric fluid;

coalescing said second series of droplets to create a fully formed microlens having a base portion of the first optical polymeric fluid under a cap portion of the second optical polymeric fluid;

holding the formed microlens at an elevated temperature for a period of time to allow diffusion of the cap portion into the base portion and diffusion of the base portion into the cap portion [under conditions which permit inter-diffusion of the cap portion and the base portion] to create a generally uniform axially gradient index of refraction in an inter-diffusion zone between the cap portion and the base portion of the formed microlens; and

solidifying the formed microlens after a time period calculated to retain a desired degree and uniformity of gradient in the index of refraction, increasing from the index of refraction of the base portion to the index of refraction of the cap portion of the formed microlens;

wherein the formed microlens has a reduced focal spot for optical uses as compared to a

non-gradient index microlens of the same character.

2. (Original) The method of Claim 1 wherein the step of depositing a second series of droplets of a second optical polymeric fluid compatible with the first optical polymeric fluid comprises the step of depositing a second optical polymeric fluid having an index of refraction about .01 or greater than the index of refraction of the first optical polymeric fluid.

3. (Original) The method of Claim 2 wherein the depositing and coalescing steps are performed relatively simultaneously wherein previous drops are coalescing while additional drops are being deposited.

4. (Original) The method of Claim 3 wherein the step of depositing a first series of droplets of a first optical polymeric fluid is performed with a printhead heated to an elevated temperature selected to reduce the viscosity of the first optical polymeric fluid to less than about 40 centipoise.

5. (Original) The method of Claim 4 wherein the step of depositing a second optical polymeric fluid is performed with a printhead depositing the second series of droplets of a second optical polymeric fluid which is heated to an elevated temperature sufficient to reduce the viscosity of the second optical polymeric fluid to less than about 40 centipoise.

6. (Original) The method of Claim 3 wherein the steps of depositing first and second optical polymeric fluids comprise the steps of depositing first and second optical polymeric fluids selected from the group consisting of pre-polymers and polymers.

7. (Original) The method of Claim 6 wherein the steps of depositing first and second optical polymeric fluids comprises the step of depositing at least one of the fluids in the group consisting of polyimides; fluorinated polyimides; polyetherimides; polybenzocyclobutenes;

polycarbonates; polyacrylics; fluorinated polyacrylics; modified cellulose/acrylics; polyquinolates; polystyrenics; polyesters; and polymers/pre-polymers comprising monomers having reactive functionality selected from epoxy, cyanato or maleimido groups.

8. (Currently Amended) The method of Claim 3 wherein [where in] the step of depositing first and second optical polymeric fluids comprises the step of depositing at least one first or at best one second optical polymeric fluid which is heat or UV curable and the solidifying step is accomplished by applying heat or UV radiation to the formed microlens after the holding step.

9. (Cancelled)

10. (Original) The method of Claim 1 wherein the step of depositing a first series of droplets of a first optical polymeric fluid from an ink-jet printhead onto a substrate comprises the step of depositing said first optical polymeric fluid onto a substrate having a surface treated to be non-wetting with respect to the first optical polymeric fluid to help control the aspect ratio of the formed microlens.

11 – 20 (Cancelled)

In the Drawings

Please substitute the attached Figure 11 for the photograph of the microlens presently on file in this application.